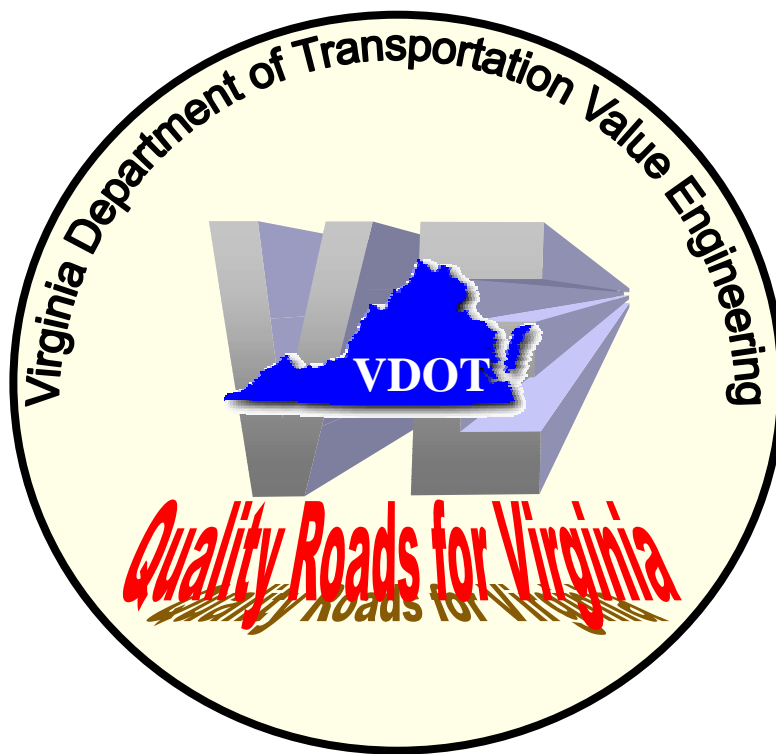


*Value Engineering  
Annual Report  
FY 98/99*



# Table of Contents

<b>Value Engineering (VE) Program</b>	<b>Page</b>
Mission	1
VE Benefits	2
VE Program Organization	3
VE Program History	4
<b>FY 98/99 Program Highlights</b>	<b>5</b>
<b>FY 98/99 Program Statistics</b>	<b>6</b>
FY 98/99 Studies Summary	7
FY 90/99 Accepted VE Recommendations	8
FY 90/99 Savings/Cost Avoidance	9
FY 98/99 Return on Investment	10
Value Engineering Program Data Summary	11
<b>FY 98/99 Program Strategies/Accomplishments</b>	<b>12</b>
FY 98/99 Sample Project Studies	15
FY 98/99 Sample Special Study	17
FY 98/99 Customer Service Survey Results	20
<b>FY 99/00 Program Strategies</b>	<b>22</b>
Appendix A: Value Engineering Job Plan	26
Appendix B: Value Engineering Advisory Committee	27

# Virginia: First in Value Engineering

The Virginia Department of Transportation's (VDOT's) Value Engineering (VE) Program is recognized nationally as a leader in the field of transportation Value Engineering. VDOT's Value Engineering Program achieves one of the highest returns on investment for the citizens of the Commonwealth. By identifying the most cost-effective use of funds, the program assists management in providing the best transportation system possible.

Value Engineering is a systematic, creative approach to obtain optimum value for every dollar spent. VE is:

- ❑ an orderly review and analysis process
- ❑ conducted by a team of experienced engineers and technicians
- ❑ the methodology that identifies and meets the function of a project or process

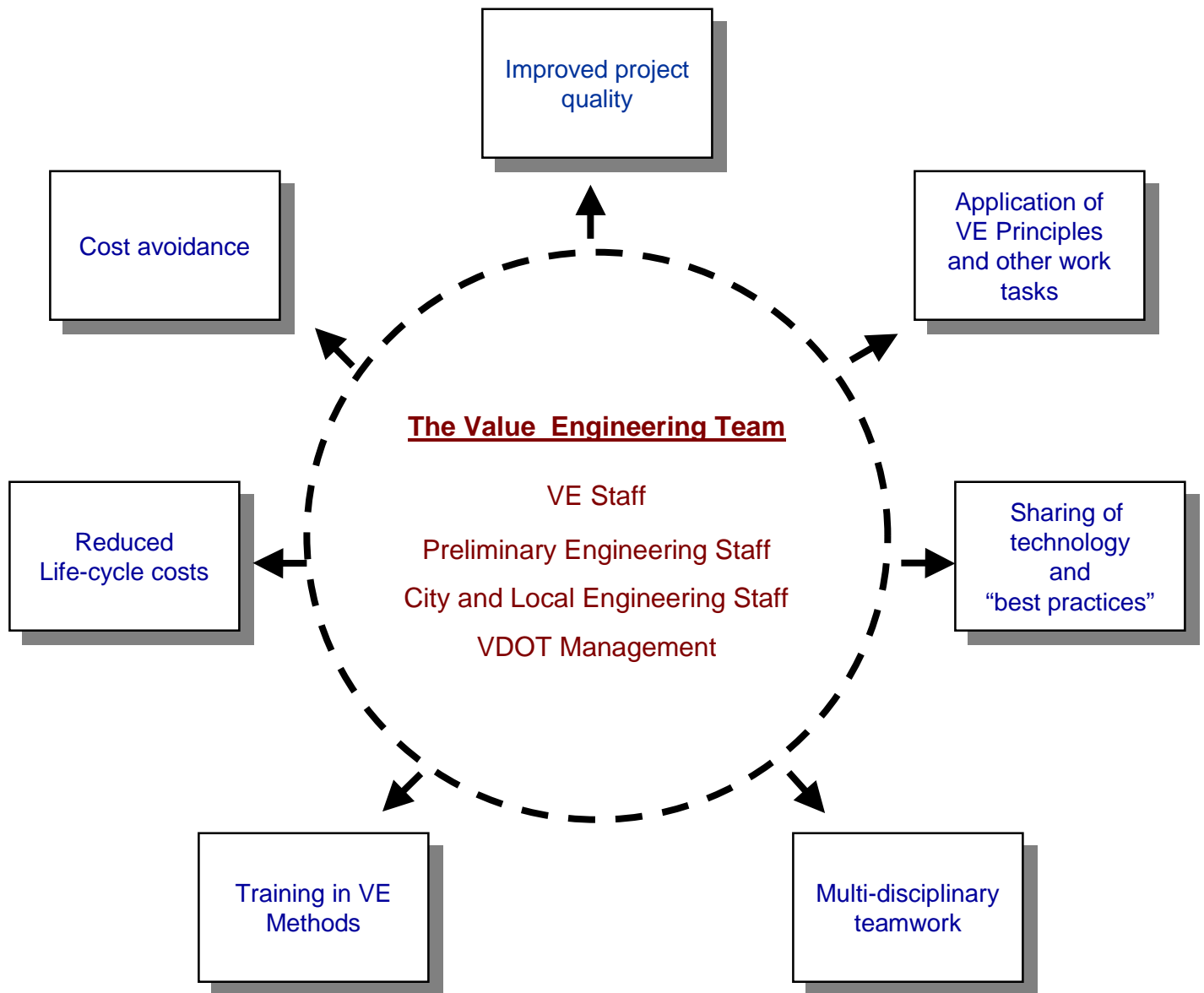
The VE Process is discussed in more detail in Appendix A.

## ***VDOT's VE Program Mission is :***

To assist VDOT management in obtaining optimum value from transportation funds through the VE process by:

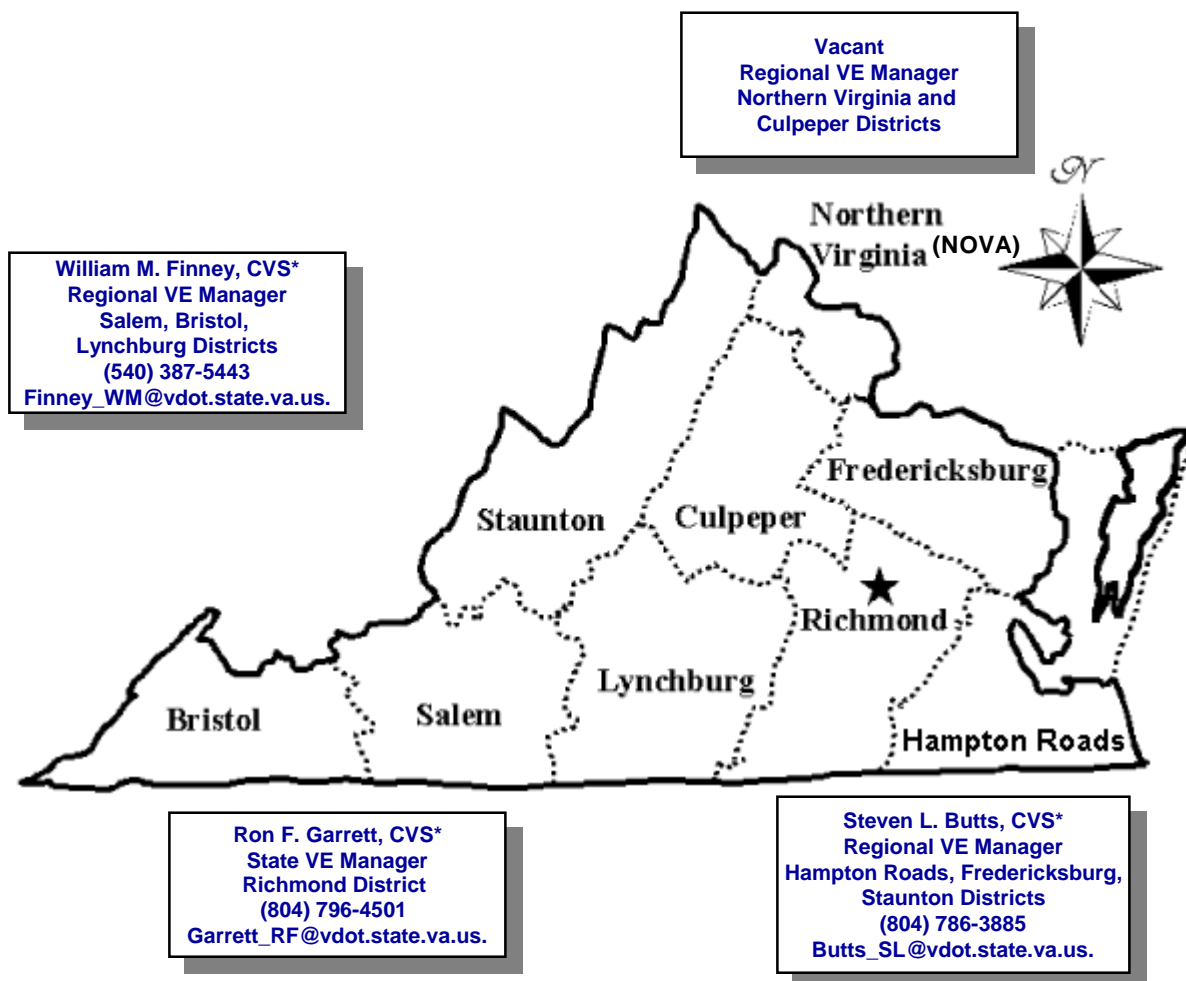
- Improving project quality
- Eliminating unnecessary costs
- Reducing overall life-cycle costs

# Value Engineering Benefits



# VE Program Organization

The VE program is staffed by four Regional Value Engineering Managers (one serving as State VE Manager). The State and Regional VE Managers are assigned to four geographical regions based on an analysis of planned construction projects, and expected project complexity. This staff represents more than 48 years of experience. The respective regions are shown below.



\*CVS (**Certified Value Specialist**) is the recognition granted to Value Engineering professionals by SAVE International. Certification is received when the professional has completed a series of requirements designed to insure that he or she is a competent, knowledgeable VE Team Leader.

# VE Program History

- Initiated in mid-1970's
- Established full-time VE position in mid-1980's
- Expanded program in 1989 to provide comprehensive statewide services
- Created Value Engineering Advisory Committee in 1990 (See Appendix B)
- Legislated by 1990 Virginia General Assembly (Section 33.1-190.1. Code of Virginia), first state with mandated program
- Appointed Southeast regional representative of AASHTO VE Task Force in 1993
- Developed and implemented Society of American Value Engineers (SAVE) approved Module 1, 40-hour training workshop in 1994
- Participated in 1993 and 1995 U.S. Congressional Educational Reception in Washington, D.C., sponsored by SAVE International
- Received Congressional "Golden Shears" Award in 1993 and 1995 (this award is presented to government agencies/private companies "for demonstrating cost savings and quality improvements to members of the United States Congress", and is sponsored by SAVE International)
- Trained 2,006 VDOT employees and others since the expansion of the mandated program
- Reached milestone in savings/cost avoidance of \$100 million during FY 95/96
- Conducted VE studies for the states of Maine, Indiana, and Colorado
- Received American Association of State Highway and Transportation Officials (AASHTO) National VE Award for Outstanding Process Study for Snow Removal in 1997
- Received Federal Highway Administration (FHWA) National VE Outstanding Achievement Award for State Highway VE Programs in 1997

# FY 98/99

## Program Highlights

- Accepted 50% of all recommendations
- Conducted VE studies on 60 construction and maintenance projects, and 4 special projects, for a total of 64 studies
- Achieved \$52.3 million in savings/cost avoidance
- Realized return on investment of 58:1
- Published 2 Value Engineering articles in national trade magazines, "Value World" and "Virginia Review"
- Trained 133 VDOT employees and conducted two Module 1 training workshops for Fairfax County staff members and Fairfax County Water Authority
- Received the SAVE International "Gordon Frank Award" for "Outstanding Accomplishment in Government"
- Reached milestone in savings/cost avoidance of \$250 million

# FY 98/99 PROGRAM STATISTICS

# FY 98/99 Studies Summary

Number of Studies Conducted	64
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Construction/Maintenance (Field Inspection Stage)	56
Construction/Maintenance (Preliminary Field Review Stage)	4
Special	4

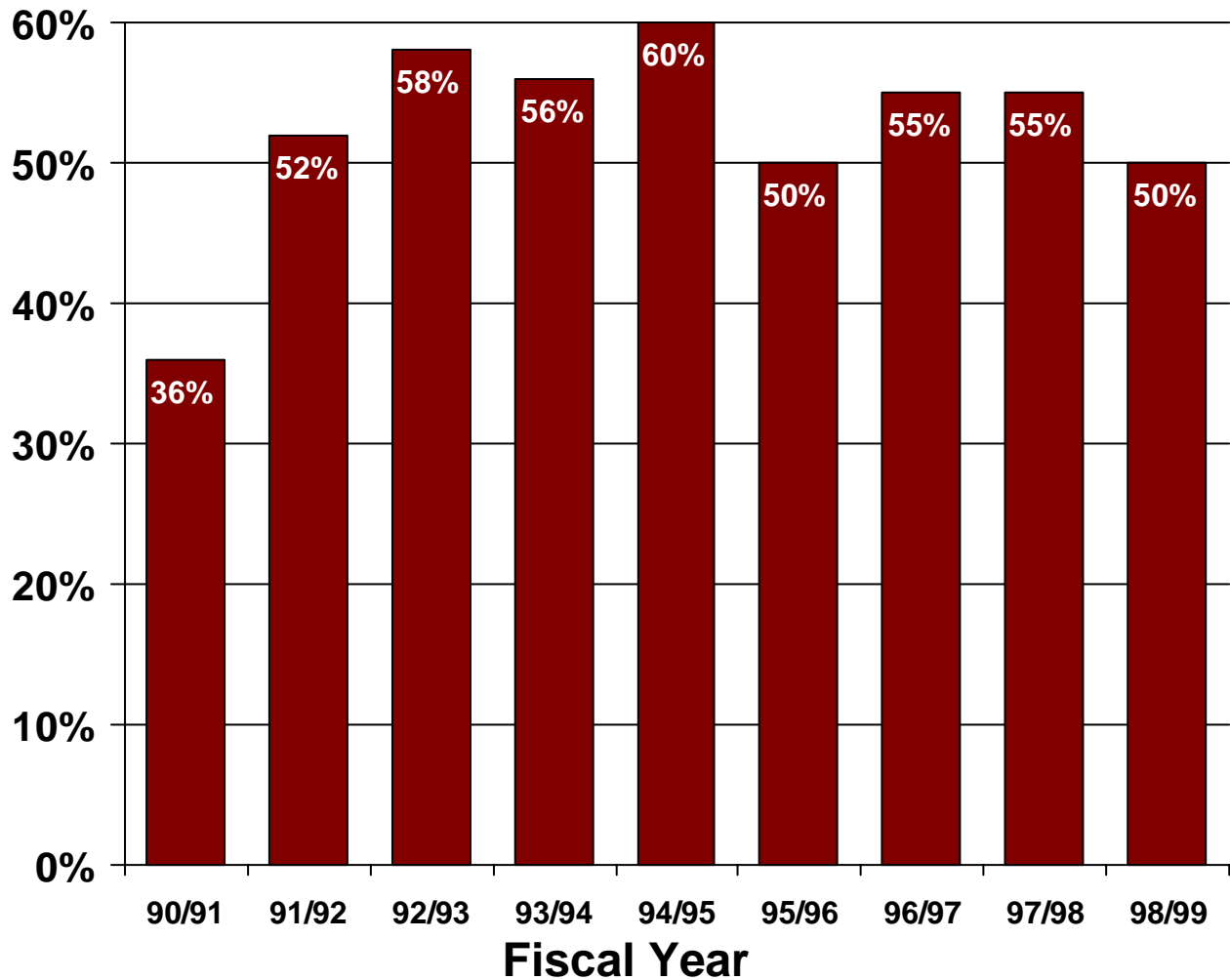
Number of Studies Closed	66*
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Construction/Maintenance	55
Preliminary Field Review	7
Special	4

Total Accepted Value Opportunities	<b>\$52,287,443</b>
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**\*Includes studies conducted in previous years**

## FY 90/99 Accepted VE Recommendations

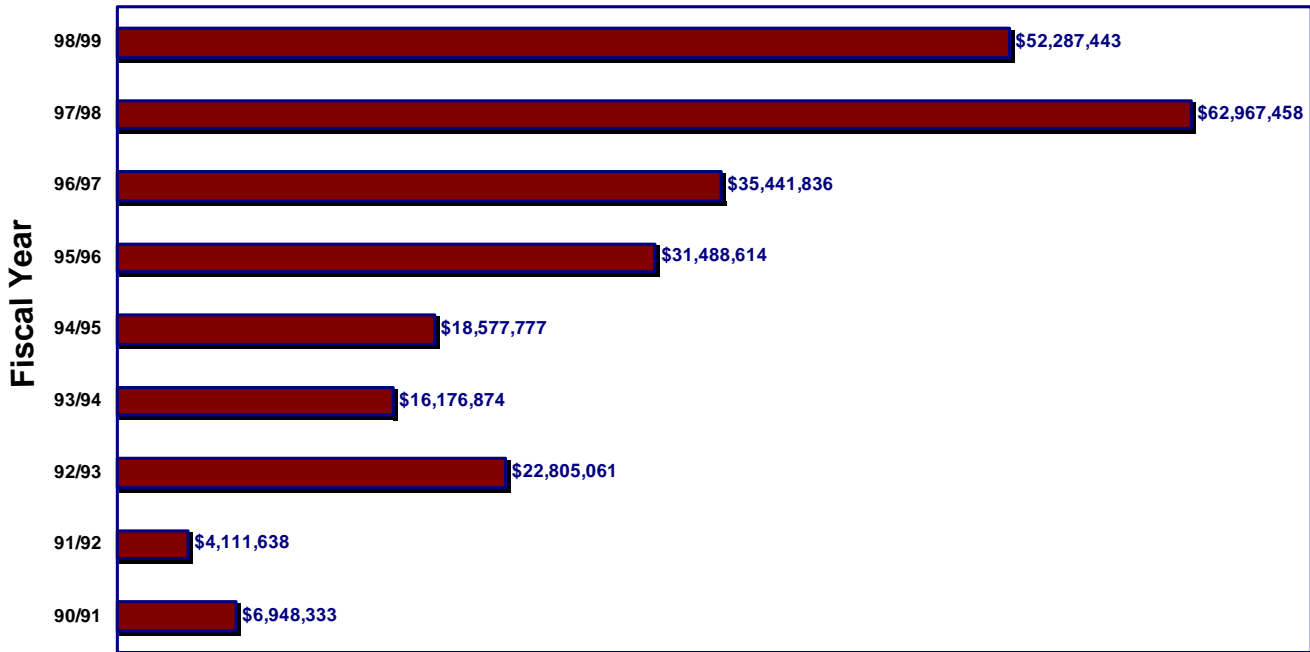


**NOTE:** See page 11 for actual number of recommendations proposed/accepted for FYs 90/91 through 98/99.

## FY 90/99 Savings/Cost Avoidance

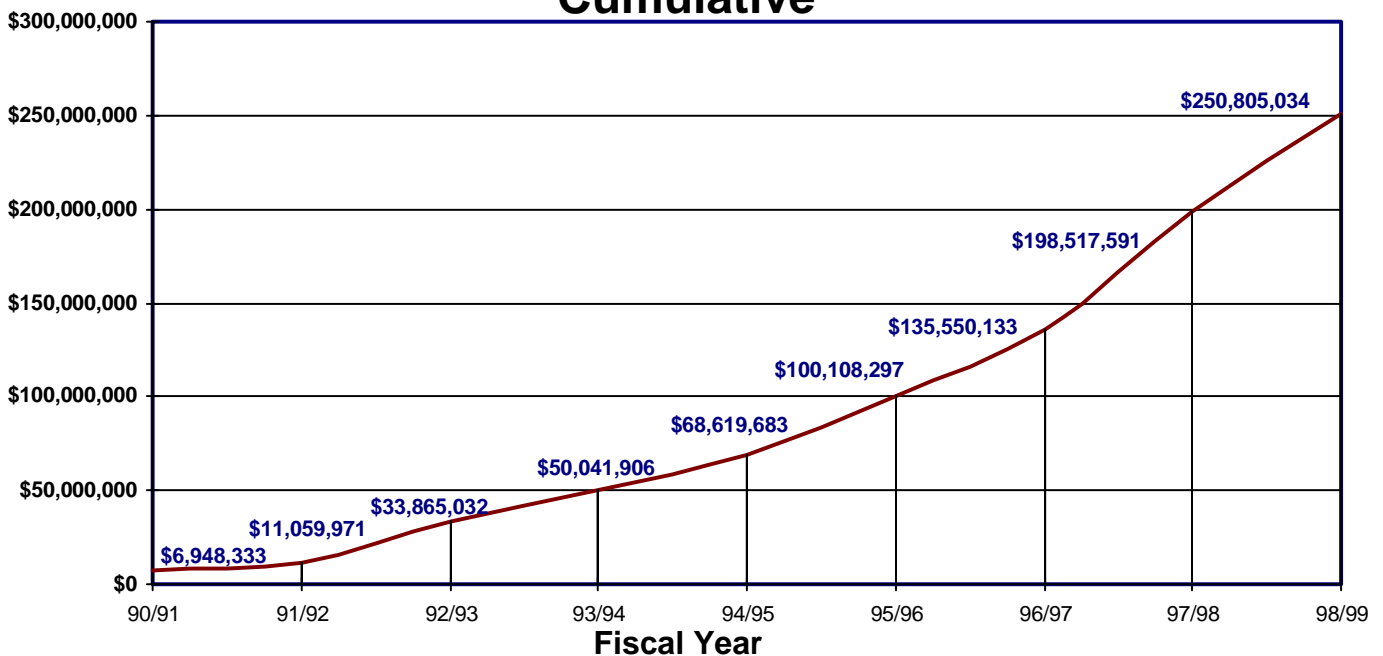
Since the expanded VE program began in July 1990, over \$250.8 million in savings/cost avoidance has been achieved. During FY 98/99, savings/cost avoidance totaled \$52,287,443.\*

### Annual



**TOTAL - \$250,805,034**

### Cumulative

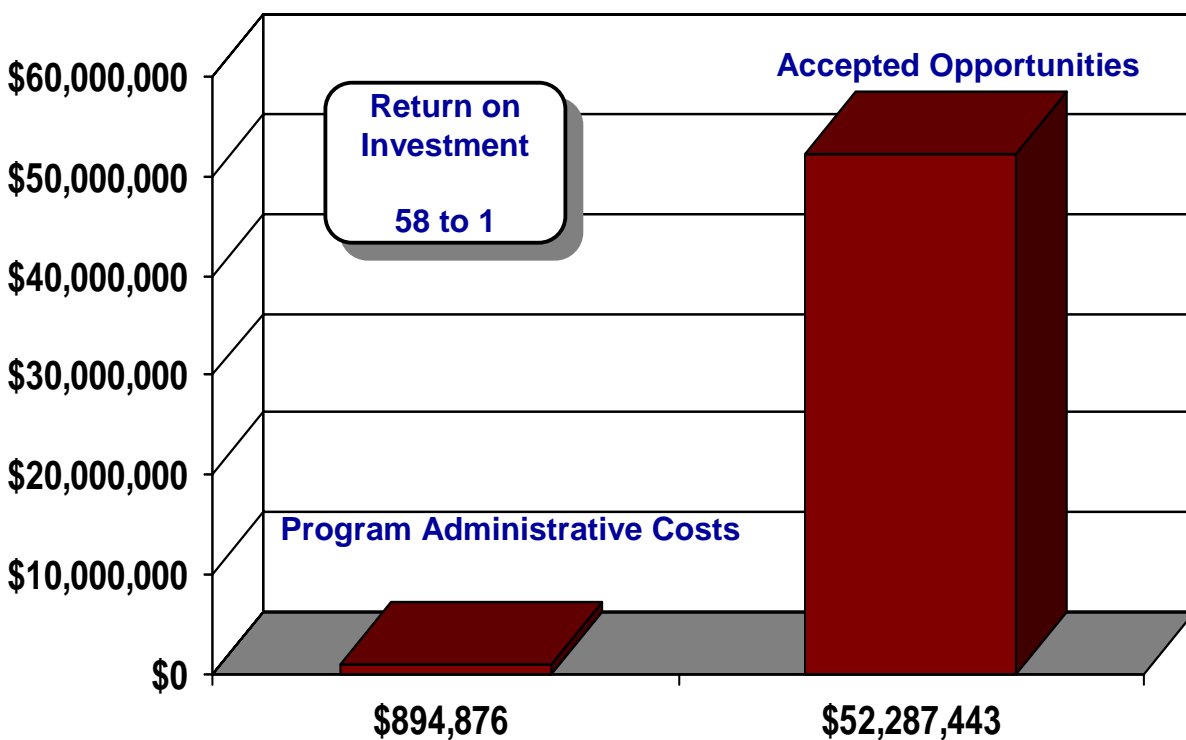


\*Savings, or cost avoidance, is the dollar value of those recommendations which have been accepted by management and incorporated into highway construction plans.

# FY 98/99 Return on Investment

## VE EXPENDITURES

● VE Staff	\$ 527,002
● VE Team Members	\$ 343,972
● Non-Salaried Direct Cost	\$ 23,902
<b>Total</b>	<b>\$ 894,876</b>



\* Total cost for VE Team Members and VE Staff includes salary plus overhead. Non-Salaried Direct Cost includes all miscellaneous expenses for travel, lodging, meals and materials.

# Value Engineering Program Data Summary

<u>FY</u>	<u>VE Program Admin. Cost</u>	<u>VE Program Accepted Savings/ Cost Avoidance</u>	<u># Studies</u>	<u>% Accepted Value Oppt.</u>	<u># of Quality Improvements Recommended</u>
1990/1991	\$172,243	\$6,948,333	66	216 / 78 (36%)	(A)
1991/1992	\$267,666	\$4,111,638	55	233/120 (52%)	(A)
1992/1993	\$402,177	\$22,805,061	75	354/206 (58%)	(A)
1993/1994	\$284,521	\$16,176,874	57	382/212 (56%)	(A)
1994/1995	\$216,042	\$18,577,777	76	400/240 (60%)	(A)
1995/1996	\$280,849	\$31,488,614	64	256/127 (50%)	(A)
1996/1997	\$326,915	\$35,441,836	81	511/280 (55%)	(A)
1997/1998	\$383,129	\$62,967,458	77	354/196 (55%)	(A)
1998/1999	\$894,876*	\$52,287,443	64	291/146 (50%)	(A)
1999/2000	\$811,338	\$ 24,570,918	59	296/148 (50%)	199
<b><i>1990/June 2000</i></b>					
<b><i>Grand Totals</i></b>	\$4,039,757	\$275,375,952**	670	3,293/1,753 (53%)	199

# FY 98/99 Program Strategies/Accomplishments

## Introduction

In 1994, VDOT began its Strategic Leadership Process to assist the Department in setting priorities and allocating resources. VDOT's mission statement was:

*"We will become the most effective customer oriented public agency in Virginia by the year 2000."*

To accomplish this mission, Strategic Outcome Areas (SOA's) were identified to provide guidance for all VDOT units in planning and performing their work. Each year, the VE Program staff develops strategies to complement VDOT's mission accomplishment.

## Strategic Outcome Areas

VDOT identified four Strategic Outcome Areas to reflect the major business functions or programs that the Department would develop to achieve its mission. These outcome areas guide VDOT to concentrate on the specific activities and performance measures related to the organization's critical issues. Each SOA includes a goal, performance measures and the specific strategies necessary to accomplish each goal. The goal identified for each SOA are listed below:

**CONSTRUCTION PROGRAM DELIVERY** - Construction projects will satisfy our customers by producing the highest quality highways and structures that are completed on time and within budget.

**SYSTEM MAINTENANCE AND OPERATIONS** - VDOT will maintain and operate its assets to the highest standards of quality and safety.

**CUSTOMER SATISFACTION** - To fully address customer needs and expectations to achieve highest levels of customer satisfaction.

**EMPLOYEE SATISFACTION** - We will make VDOT a great place to work.

**VDOT Strategic Outcome Areas**  
**Construction Program Delivery & System Maintenance and Operations**

**FY 98/99**  
**VE Strategy**

**Conduct studies on all construction and maintenance projects with estimated costs of over \$2 million and on all special programs or projects requested by management**

**STRATEGIES/ACCOMPLISHMENTS:**

- To study 100% of the construction/maintenance projects exceeding \$2 million that reach field inspection
  - ***Conducted VE studies on 64 construction and maintenance projects (all projects in excess of \$2 million) with a total accepted savings/cost avoidance exceeding \$52 million***
- To conduct a minimum of ten preliminary plan review stage studies as requested by management
  - ***Conducted all preliminary plan review studies requested by management, a total of 4***
- To perform five special, standards and specifications studies as requested by management
  - ***Conducted all special studies requested by management, a total of 4***
- To combine studies on sequential projects for continuity and economies of scale
  - ***Conducted 4 studies on sequential projects***

## **STRATEGIES/ACCOMPLISHMENTS (cont'd.):**

- To streamline the VE process by overhauling the report format to make reports easier to produce and disseminate
  - ***Revised VE report format***
- To consult with decision makers to determine how to expedite completion of the VE Approval Form
  - ***Exploring possibilities with decision makers such as a Cycle of Service study, interviews, etc.***
- To reduce delays in making revisions to project plans
  - ***Advance notice of changes to project plans were given to Project Managers. The VE staff has been proactive in expediting the return of approval forms and bringing closure to project studies***

# FY 98/99

## Sample Project Studies

**Yorktown Road and Jefferson Avenue, Newport News:** This study of the proposed reconstruction of the Yorktown Road/Jefferson Avenue intersection conducted during a training workshop in Hampton Roads, resulted in improvements of the stormwater management system and the reuse of the existing pavement in the reconstruction process, with a savings/cost avoidance of over \$600,000, or 12% of the estimated construction cost.

**Route 627, Meadowbridge Road, Hanover and Henrico Counties:** The scope of work for this project was to widen Meadowbridge Road to 5 lanes inclusive of a flush center turn lane. This typical section can be utilized as reversible lanes to accommodate traffic during NASCAR race events at Richmond International Raceway. The Value Engineering team submitted recommendations to revise improvements to an intersection providing a savings/cost avoidance of \$993,000. The project will still accomplish the basic function intended and maintain the original scope of work.

**Radford Memorial Bridge Replacement, Montgomery and Pulaski Counties:** The Radford Memorial Bridge replacement project was a consultant-led Value Engineering study. The project encompassed a city park, the Norfolk Southern Railroad, a historic property and a high school. The Value Engineering team recommended modifying the bridge width and length, and modifying the high school service road for a savings/cost avoidance of over \$1.4 million.



***Radford Memorial Bridge***

## FY 98/99 Sample Project Studies (Cont'd)

**Big Stone Gap Bypass, Wise County:** The Route 58 Corridor Improvement Program is intended to stimulate economic development in Southside and Southwest Virginia. The Value Engineering study was conducted during a Value Engineering workshop and resulted in over \$20 million in savings/cost avoidance. Approved recommendations included modifying the median and maintaining existing traffic patterns to Alternate Route 58 and 23, in lieu of constructing the East Fifth Street Bypass connection.

**Route 123 Widening:** This project will widen the 11.29 km length of Route 123 between Occoquan and Burke Lake Road in Fairfax County from the existing two lane section to a four-lane divided section. Accepted recommendations included reducing the quantity of rock excavation and reconstructing the existing Occoquan Bridge. These recommendations resulted in a savings/cost avoidance of \$1.7 million.



**Route 123**

# FY 98/99

## Sample Special Study

**Route 460, Buchanan County:** The basic functions of this joint project between VDOT and the US Army Corps of Engineers are “Control Flooding” and “Improve Accessibility”. The project will provide the Town of Grundy flood-control measures to prevent damage from floods similar to the one experienced in 1997. Part of the flood-control effort includes constructing an eight-foot ringwall around the Grundy Historic District and elevating Route 460 to serve as a floodwall along the Levisa River. The Army Corps of Engineers will be constructing an approximately 13-acre redevelopment site to relocate businesses displaced by the roadway construction. VDOT will be responsible for the roadway construction. This Value Engineering study, led by VDOT, was a cooperative effort which also included team members from the Army Corps of Engineers, the project consulting design firm and the Town of Grundy. Study recommendations included reductions in excavation, adding replacement parking and constructing the Army Corps of Engineers bridge early in the construction sequence to provide flexibility in maintenance of traffic. These recommendations resulted in savings/cost avoidance of \$5.5 million.



*Town of Grundy*

**VDOT Strategic Outcome Area**  
**Customer Satisfaction**

FY 98/99  
VE Strategy

**Provide extraordinary Customer Service to all VDOT employees and other members of the transportation industry**

**STRATEGIES/ACCOMPLISHMENTS:**

- To assist a minimum of two other state, county, or local governments in the development of their VE Programs
  - *Assisted Fairfax County and Fairfax County Water Authority in development of their VE Programs*
  - *Discussed/distributed VE Guidelines and literature to other state, county, and local governments in development of their VE Programs*
- To provide information to VDOT and others upon request within 3 working days
  - *100% of the requests for information, relative to the VE Program, were fulfilled within 3 working days*
- To identify alternative resources for team staffing
  - *Utilized one private sector team leader to conduct a study*
- To promote the capabilities of the VE Program and continue to expand the use of the VE methodology by conducting annual presentations to each district
  - *Discussed capabilities of the VE Program with district designers. Suggestions were made for possible special studies; overall, each district interviewed was satisfied with the performance of the Regional VE Manager for their district*

## **STRATEGIES/ACCOMPLISHMENTS (cont'd.):**

- To market the VE Program by increased distribution of the VE Annual Report and brochure to each state DOT and others in the transportation industry
  - ***Annual reports and brochures were distributed to General Assembly Members, Virginia's Congressional Delegation, 49 state DOT's, 2 foreign delegations, and others as requested***
- To design/revise the VE Database to provide detailed VE data in an accurate and timely manner
  - ***Redesign of the VE Database is currently underway***
- To conduct a VE study of the VE Program (every three years) to identify program improvements
  - ***Scheduled to be conducted during FY 99/00***
- To determine the effectiveness of preliminary plan review stage studies and report findings to management in response to input received through Customer Service Surveys
  - ***Received support from L&D and district preliminary engineering managers. The effectiveness of preliminary plan review stage studies continues to be evaluated. Further results will be provided when a sufficient number of studies have been conducted at this stage***

# FY 98/99 Customer Service Survey Results

As a part of our on-going Customer Service initiatives, the VE staff interviewed the District Administrators, Construction Engineers, and Location & Design Engineers. These interviews were conducted to:

- receive feedback on the performance of the Regional VE Managers;
- determine quality of reports/recommendations;
- identify special studies of processes/procedures; and
- research resources for alternative team members

The Project Manager's survey continues to be distributed for every project studied. Responses received through the end of FY 98/99 indicated an overall high degree of satisfaction with the performance of the VE Program. All of the comments received were positive, indicating that the project managers believe that the VE staff works well with them to initiate, conduct, and report on VE studies appropriately. The suggestion for improvement was to bring the response process to a more timely conclusion. The VE Program staff is making a concentrated effort to improve the response process to correct this situation (see FY 99/00 Strategy, page 24).

Course evaluation forms are given to each participant in VE training courses. During FY 98/99, a total of 154 evaluations were received. Each participant was asked to rate the overall course on a scale of 1-10, with 1 being poor and 10 being excellent. The average rating was **8.4**.

During FY 98/99, continued emphasis was placed on training maintenance personnel. A total of 10 Maintenance Superintendents and Maintenance Supervisors attended classes.

**VDOT Strategic Outcome Area**  
**Employee Satisfaction**

**FY 98/99**  
**VE Strategy**

**Coordinate and conduct Value Engineering training for VDOT employees and other members of the transportation field**

**STRATEGIES/ACCOMPLISHMENTS:**

- To train a minimum of 100 individuals in the Value Engineering methodology as requested by management
  - ***Conducted six VE training workshops for 159 participants (133 VDOT employees)***
- To accomplish certification and recertification for all VE Managers by providing all necessary resources to meet the requirements of SAVE International
  - ***100% of VE Managers have received certification***
- To maintain enrollment in SAVE International as a Corporate Sustaining Member for VDOT and four Value Engineering staff on a yearly basis
  - ***VDOT continues to maintain a Corporate Sustaining Membership of SAVE International***
- To support training initiatives to improve the knowledge, skills, and abilities of the VE staff by attending a minimum of 15 hours of training
  - ***100% of VE staff attended a minimum of 15 hours of training to enhance KSA's***
- To encourage Divisions and Section managers to have a sense of "ownership" in the VE Program
  - ***Conducted a Cycle of Service study in conjunction with Location and Design Division to increase ownership in the VE Program***
- To develop and implement "Value Analysis" or "Value Management" training for non-engineering employees at VDOT
  - ***Invited Buildings and Grounds staff to participate in VE training. Also included other non-engineering employees at VDOT***

# FY 99-00 PROGRAM STRATEGIES

**VDOT Strategic Outcome Areas**  
**Construction Program Delivery & System Maintenance and Operations**

**FY 99/00**  
**VE Strategy**

**Conduct studies on all construction and maintenance projects with estimated costs of over \$2 million and on all special programs or projects requested by management**

**STRATEGIES:**

- To study 100% of the construction/maintenance projects exceeding \$2 million in accordance with The Code of Virginia and Management Services Division policy
- To conduct a minimum of five special, and standards/specifications studies as requested by management
- To explore the possibility of conducting a “Cycle of Service” study on the report/response procedure to improve response time
- To participate in major project scoping meetings to enhance the VE knowledge of the project scope and schedule
- To use the VE methodology to address strategies for process improvements within VDOT
- To identify alternative quantifiable measures of success of the VE Program in addition to savings/cost avoidance

**VDOT Strategic Outcome Area**  
**Customer Satisfaction**

**FY 99/00**  
**VE Strategy**

**Provide extraordinary Customer Service to all VDOT employees and other members of the transportation industry**

**STRATEGIES:**

- To measure customer satisfaction with services provided during project studies and implement suggested recommendations for improvement
- To accommodate all state, county, and local governments requesting assistance in development of their VE Programs
- To train a minimum of 100 individuals in the Value Engineering methodology as requested by management
- To develop guidelines for incorporating the use of private sector team members for VE studies
- To market the VE Program by attending in-house engineering conferences and presenting/providing information relative to the VE Program
- To continue to design/revise the VE Database to provide detailed VE data in an accurate and timely manner
- To recognize retiring VDOT employees for service as VE team members
- To pursue inclusion of the VE section on VDOT's Internet site

**VDOT Strategic Outcome Area**  
**Employee Satisfaction**

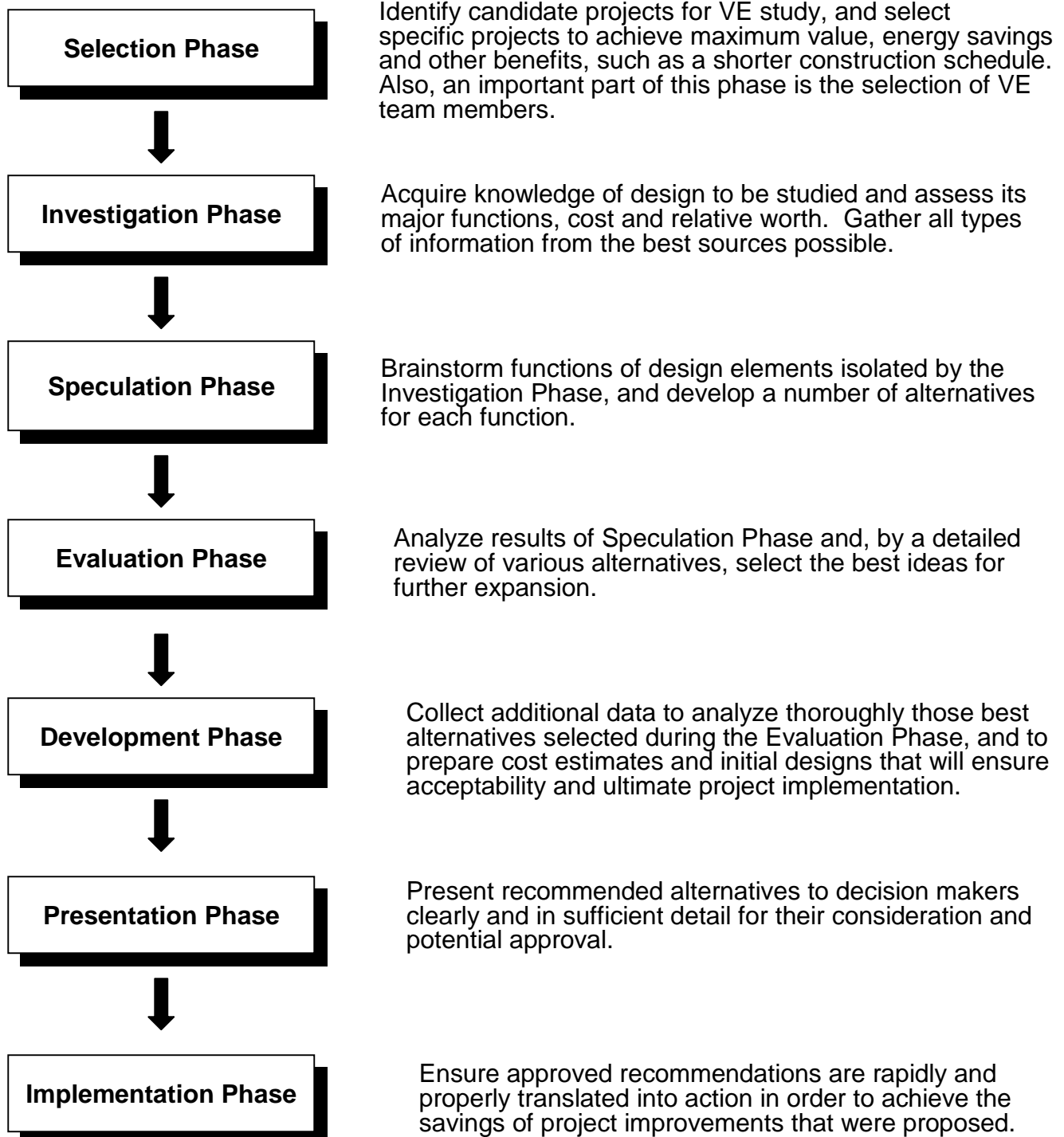
**FY 99/00**  
**VE Strategy**

**To provide support and resources to VE staff members to enhance  
their professional knowledge, skills, and abilities**

**STRATEGIES:**

- To accomplish certification and recertification for all VE Managers by providing all necessary resources to meet the requirements of SAVE International
- To maintain VDOT enrollment in SAVE International as a Corporate Sustaining Member on a yearly basis
- To continue to serve as an AASHTO Value Engineering Task Force Member
- To recognize VE staff for outstanding accomplishments/achievements
- To support training initiatives to improve the knowledge, skills, and abilities of the VE staff by attending a minimum of 15 hours of training

# Value Engineering Job Plan



# Value Engineering Advisory Committee

The Value Engineering Advisory Committee provides overall guidance and direction for the VE Program. This committee consists of the following persons, or their designees:

Larry D. Jones, Management Services Division Administrator (Chair)

Claude D. Garver, Jr., Deputy Commissioner

James G. Browder, Jr., Chief Engineer

Assistant Commissioner for Operations

Dan H. Marston, Bristol District Administrator

Tom A. Hawthorne, Richmond District Administrator

Thomas F. Farley, Northern Virginia District Administrator

Fred C. Altizer, Jr., Salem District Administrator

James C. Cleveland, Hampton Roads District Administrator

C. Frank Gee, Construction Division Administrator

Earl T. Robb, Environmental Division Administrator

Jimmy T. Mills, Location & Design Administrator

Andy V. Bailey, II, Maintenance Division Administrator

Stuart A. Waymack, Right of Way & Utilities Division Administrator

Malcolm T. Kerley, Structure & Bridge Division Administrator

Ilona O. Kastenhofer, Traffic Engineering Division Administrator

Emily Lawton, Federal Highway Administration Representative

Ron F. Garrett, Management Services Division, State VE Manager (Staff)